

CLAIMS

1. A method for initiating flow control in a network multiplexer that forwards a message descriptor referencing a communications packet received by a receiving port to one
5 or more transmit queues, each transmit queue associated with a transmitting port which transmits communications packets queued to the transmit queue, the method comprising:
 providing each transmitting port in the network multiplexer with a high threshold and a low threshold;
 when a message descriptor is queued to a transmit queue associated with a
10 transmitting port,
 when the transmit queue currently contains a maximum number of message descriptors, discarding the message descriptor, and
 when the transmit queue currently contains a number of message descriptors equal to or greater than the high threshold of the associated transmitting port,
15 sending a flow control request to the receiving port that received the communications packet referenced by the queued message descriptor.
2. The method of claim 1 further including:
 when a message descriptor is queued to a transmit queue associated with a
20 transmitting port,
 when the transmit queue currently contains a number of message descriptors greater than or equal to the low threshold of the associated transmitting port, but the number of message descriptors contained in the transmit queue exceeded or equaled the high threshold of the associated transmitting port more recently than the number of message
25 descriptors contained in the transmit queue was equal to the low threshold of the associated transmitting port, sending a flow control request to the receiving port that received the communications packet referenced by the queued message descriptor.
3. The method of claim 1 further including:
30 when a transmitting port transmits a packet referenced by a message descriptor,
 releasing the message descriptor, and

when the destination port currently contains a number of queued message descriptors equal to one less than the destination port's low threshold, sending a release flow control request to any receiving ports to which a flow control request was sent while the transmit queue contained a number of message descriptors equal to or greater than the high
5 threshold of the associated transmitting port.

4. The method of claim 2 further including:

when a transmitting port transmits a packet referenced by a message descriptor,
releasing the message descriptor, and

10 when the destination port currently contains a number of queued message descriptors one less than the destination port's low threshold, sending a release flow control request to any receiving ports to which a flow control request was sent while the transmit queue contained a number of message descriptors greater than or equal to the low threshold of the associated transmitting port.

15 5. The method of claim 4 further including:

when a receiving port is flow controlled and receives a number of release flow control requests equal to the number of received flow control requests,
releasing flow control by the receiving port.

20 6. A network multiplexer system that links physically separate network media by forwarding packets received from each network medium to a number of network media, the network multiplexer system comprising:

a number of ports, each port having a transceiver and a communications controller;

25 a memory;

an internal bus for transferring packets from ports to memory and from memory to
ports;

a receive queue and a transmit queue associated with each port that contain message
descriptors that reference packets stored in memory;

30 a high threshold and a low threshold associated with each transmit queue;

an indication of ports to which flow control requests have been made associated with each port; and

an indication of the number of flow control requests made to a port associated with each port.

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7. The network multiplexer of claim 6 wherein, when a message descriptor is forwarded to a port for transmission, and when the transmit queue of the port is full, the message descriptor is dropped.

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8. The network multiplexer of claim 6 wherein, when a message descriptor is forwarded to a port for transmission, and when the transmit queue of the port contains a number of message descriptors greater than or equal to the high threshold associated with the port, a flow control request is sent to the port that received the communications packet reference by the message descriptor and a indication that a flow control request has been sent to the port that received the communications packet is saved by the port to which the message descriptor is forwarded.

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9. The network multiplexer of claim 6 wherein, when a message descriptor is forwarded to a port for transmission, and when the transmit queue of the port has contained a number of message descriptors greater than or equal to the high threshold associated with the port more recently than the transmit queue of the port has contained a number of message descriptors less than the low threshold associated with the port, a flow control request is sent to the port that received the communications packet reference by the message descriptor and a indication that a flow control request has been sent to the port that received the communications packet is saved by the port to which the message descriptor is forwarded.

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10. The network multiplexer of claim 6 wherein, when a port removes a message descriptor from the transmit queue associated with the port, and when the number of messages contained in the transmit queue currently equal one less than the low threshold associated with the port, a release flow control message is sent to each port referenced by indications saved by the port.

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